

Mercury Action Plan

PROBLEM STATEMENT: Mercury has been found throughout the San Francisco Bay-Delta estuary at elevated concentrations in water, sediment and organisms. Mercury is of concern from both an environmental and human health perspective. Effects on fish include death, reduced reproductive success, impaired growth and development, and behavioral abnormalities. Mercury exposure in birds can cause reproductive effects, in plants can cause death and sublethal effects. The direct and additive effects of mercury within the estuary on reproduction, development and juveniles of aquatic and aquatic-feeding species is poorly understood.

In general, mercury accumulates up aquatic food chains so that organisms in higher trophic levels have higher mercury concentrations. High mercury levels in sport and recreational fish have culminated in consumption advisories in which some consumers are advised not to eat these fish. Mercury (in the form of methyl mercury) poses a serious concern to human health as it accumulates in tissue, bioaccumulates within the food web, and is a potent neurotoxin in humans. Mercury can cause nervous system damage in developing fetuses, as well as in children and adults.

Elevated sediment concentrations - Yuba River, Bear River, Cache Creek, Putah Creek, Stony Creek

Water bodies/segments included in 303(d) Impaired Water Bodies list due to mercury - Delta waterways, Marsh Creek; lower American River, Cache Creek, lower Feather River, Harley Gulch, Humbug Creek, Sacramento River (from Red Bluff downstream to the Delta), Sacramento Slough, Sulfur Creek; Panoche Creek, Salt Slough, San Carlos Creek

Fish consumption advisories -

- 1971- DHS health advisory on striped bass consumption by pregnant women and children
- 1994 - OEHHA advisory on fish caught in SF Bay - sportfish limits, large shark and striped bass

SOURCES:

- Atmospheric transport
- Active and Abandoned mercury mines in Coast Range
- Cinnabar (HgS) deposits in Coast Range
- Hydraulic mining debris in Sierra Nevada
- Contaminated sediments redistributed throughout Bay-Delta watershed from gold mining activities

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SOLUTION /APPROACHES: Implement a coordinated, well-planned effort to determine cost-effective solutions for remediation of the problem. The recommended approach is multi-pronged, 3-phased approach and includes the following activities. Conduct a thorough risk appraisal for the Bay-Delta and tributaries, including the major rivers and their tributaries to determine the extent of the problem or risks to humans and wildlife. Following that, conduct an exposure assessment to determine the major sources and transport, as well as the transformation of biologically available mercury. In parallel, formulate a risk management strategy for remediation. Conduct public awareness and education activities.

Phase I: (5-years)

1. Risk appraisal and advisory –> determine risk to humans & wildlife
2. Source, transport, minesite inventory & geological site inventory
3. Transformation and bioavailability studies
4. Information management
5. Public Outreach

Phase II: (3-5 years)

1. Fish tissue monitoring
2. Implement remedial actions
3. Refine/verify models

Phase III: (3-5 years)

1. Continue fish tissue monitoring –> remove advisories & no new advisories
2. Water and sediment monitoring –> evaluate effectiveness of remediation efforts
3. Continued information management
4. Continued public outreach